QL Bulletin #1-94

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This newsletter publishing activity will not stop! There is simply more to publish as the material builds up and the notes for new article ideas continue to get pushed aside, the articles unwritten. So here is another issue, for one more year.

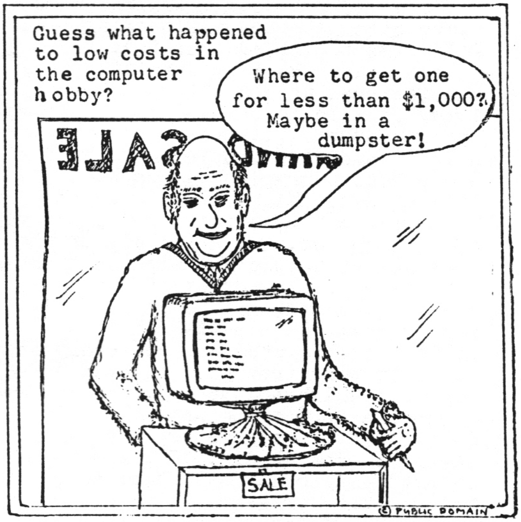
Although our computers may seem to some obsolete, they still offer some amusement to us, and while their is fun, there is value in not putting them to rest in some land-fill site! Whether we delinght in amateur programming or just amateur armchair philosophizing, computers offer us a chance to slip into another mode of mental activity, and one that offers the rewards that only a hobby can bring.

There seem to be two approaches to lifelong learning as well as education in the high schools. The first, that of progressive education that advises some to teach and learn less in order to let the natural abilities flow, seems to have had its day. The other, of becoming not what in the older days would have been called a generalist, but comprehensively educated, seems on the path to victory. This latter school of thought was well expressed by Alfred North Whithead in the 1930's and seems by its mention in the new 'Wholeearth Catalog For The Millenia" to call for a higher order learning, and one that does not scorn detials or advocate choosing just one field to specialize in. Surely it is the lesson of the job market for computer skilled in the 1990's, that the useful person must bring more book-learning to bear, and more than one specialty to a job. During the time of setting up a new computer system, that means knowing not only about computers and computerization, but also knowing enough about what is to be computerized to avoid blunders or shallow paradigms.

The good news is that this is custom work which must more and more be tailored to the culture of a country, a company and the type of employee level found at work in the local workplace. So the experience of those of the pre-computer era is all the more valuable. So now is not the time to give up your hobby of exploring and thinking about computers.

It seemed like a good time to issue another small format newsletter in our series before another year goes right by, especially since there is much material more, to publish in our files. It seems to always amaze me how fast time seems to go and hard to believe a couple of years have now passed, since the last small-format newletter, but on examining the files, it seemed clear that it had. The question of of the relevance of user groups and hobby newsletters keeps being raised as each group that folds comes as another blow to our steady resolve. Well, it does not matter much it seems to this publication, so rather than announce some day that it is closing, it is more likely just going to fade away. But until then, some new ideas to organize it around have popped into the mind.

STOCK JOKE


Guess what happened to low costs in the computer hobby?
Where to get one for less than $1,000? Maybe in a dumpster!
SALE
SALE
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For new correspondents, please send a couple of bucks to cover postage in answering.

WRITTEN AS A HOBBY ACTIVITY BY ~

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The Timex-Sinclair Story — or — What Made Sir Clive Sinclair Tick

Sir Clive Sinclair, only received the 'Sir' after his success in the sort of high technology entrepreneurship that seemed a vindication of the tough measures of former British Prime Minister Thatcher, to free British industry of regulation and socialism. But those who have wondered why he did not just seek a comfortable academic job in university, just do not know his story. Son of an engineer and at a time when his dad was having trouble keeping the family afloat financially, he had no university degree, even though, thanks to the demanding British system of academic stream high schools (called strangely 'grammar schools') he was able to get some serious mathematical training that brought out his genius in that field. So he became a technical writer for an electronics magazine, writing also complete plans for electronics do-it-yourself projects. So what saved him, was the love of hobbies of a practical and industrial bent, that seems an anglo preference. Of course the mathematics wizardry did serve him in good stead when he had to get the BASIC compilers for his home computers written, including the mathematics routines (all in machine language, or perhaps some special development language too).

He started out in the electronics business proper, as his own boss, producing kits of miniature hi-fi amplifiers, and so on, and at a time when pocket calculators were expensive, he offered kits. Again his mathematics came in handy when he had to redo the conventional square root algorithm, in a motel in the USA, while was putting the finishing touches on a scientific-oriented calculator, and needed a new algorithm and quickly, since the conventional one would not fit in the limited memory of the calculator. Anyway, after further financial ups and downs, he brought out the first home computer to sell for around £200 and a neat masterpiece suitable for those of modest means and limited accommodation, by being physically small as well, not that Sir Clive had not had a share in experiencing the constraints of modest living himself. So perhaps his liking for the small and the affordable, reflects a desire to make those things he would have wanted once, in those circumstances, Technology reflects values, and likely a lot of simple wish fulfillment carried over from an earlier time in the designer's life, too.

Then came the tiny Sinclair ZX-81, also sold as the Timex 1000, because it was manufactured at a Scottish Timex plant, (now closed down due to economics), and Timex decided to buy the rights to market it, themselves, after seeing so many come off the assembly line (or packaged as kits). The ZX-81/TS1000 had a floating point BASIC, something requiring twice the ROM size (8K over 4K of the ZX-80) and it used a MOS i.c. to replace a bunch of TTL i.c.'s (silicon chips) in order to keep the prices down. With its Z-80 running at 3¼ MHz, it was not a fast BASIC computer, but one easy to program and edit programs entered in, in fact an excellent experimenter's hobby computer. It certainly educated a large number of hobbyists of that era in

A lot of people who went on to form their own small businesses, got started making or writing programs for, ZX-81/TS1000 accessories and the computer itself, and a lot simply got jobs on the basis of experience in the work of writing their own programs on the ZX-81/TS1000. It certainly educated a large number of hobbyists at that time, because almost everyone then owned a ZX-81/TS1000, at least for a time, since it was first and cheapest on the market then. But it is ironic, that the computer which spawned a large self-education wave, in part through computer user groups, a sort of techno-self-help group network, if a mailorder rather than electronic based network, started as a failure in the educational field, rejected by the experts. The ZX-81/TS1000 was an upgrade of the ZX-80, redesigned to enter the competition for a cheap home computer to be used in the BBC, state-owned broadcasting company programs to bring computer literacy to the millions in the context of a correspondence course accompanied by educational braodcasts. The reason the ZX-81/TS1000 failed was lack of certain instructions that would aid in teaching the principles of modern structured programming, and as a result, the ZX-81/TS1000 was put on the private market, for sale to anyone, and the BBC chose the Acorn Atom and its BBC BASIC (later to be adopted for the Cambridge Z-88 notebook of Sir Clive).

From that followed the enlarged capacity and improved Spectrum series of computers, like the previous Sinclairs, Z-80 based, which became widely used by small business in figuring the value added tax and for games by children. A not completely compatible US version, the TS-2068, similar in capabilties to the Commodore 64 but slow, allowed the Sinclair computer user groups to go for another stretch until the completely incompatible 68008 micro-processor-based Sinclair QL was marketed, this causing a deeper split in users in the user groups betwen QL and Z-80 based computers most having moved up to the Z-80 based, TS2068, which could, with the use of a cranky piece of software, convert most ZX-81/TS1000 programs to run in its dialect of BASIC (those without machine language or PEEK's and POKE's to ZX-81 memory).

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The Invention of Disk Drives: A Success Story For IBM

If you look at the floppy disk drive of your computer, you probably have to strain your imagination to remember how it was with computers before disk drives were invented. In those days, electronic memory was expensive and most pre-1970 computers relied on cheaper, bulkier forms of memory, even solid magnets (core storage) for RAM and even before magnetic tape drives, punched paper tape and the punched cards the size of an old US dollar bill were tried. Such media needed big buildings for permanent storage of programs and data. Unfortunately also punched paper or cardboard devices were very slow due to their mechanical nature, feelers, wheels and their momentum and size, only capable of a certain speed of being pushed around before they bacame inacurrate or floated between binary 1 and zero, not touching anything. In fact, the main progress of electronic computers has been to save on the size of the physical objects used to represent binary 1 and 0, from the mechanical calculators' one-inch diameter wheels down to tiny bunches of electrons that respond to a push with the speed of light, and for which a push may take only a tiny bit of energy. Making a mechanical computer is possible, but the size of it and energy to push the wheels around even slowly, would make it skyscraper-sized to do even the simplest practical work. When mechanical devices are governed by limits of inertia (momentum)=weight x speed (physicists use the more precisely framed mass and velocity, mv, if you are going to be looking this up in a reference book) then reducing the weight by reducing the size of each part of a computer used to represent a binary bit is obviously the way to go, and the way computer science has gone. The complexity of the logical and math problems (even addition) that computers need be used to solve to be useful, means many binary bits and many, many parts used to physically represent them, too many for mechanical computers to be useful except in a pinch, when nothing else was available. As for using magnetic storage on tape instead of mechanical storage on punched paper tape or punched cards, the same sort of efficiencies could be had by magnetizing a very tiny area on a ferric oxide coating on plastic tape as opposed to making a rather large hole in paper or cardboard.

It seems we take computers so much for granted now that we forget that they are purely physical ways of working out arithmetic and other information and logical problems, much the way ancient civilization's accountants used to, for example divide 121 apple baskets into three by taking 121 beans and splitting them into three equal sized groups, and then a simple count of one group could tell how many apple baskets would be one third (and how many would be left over). This is simply a base of letting small, physical objects represent numbers to be divided, added , subtracted, compared, etc. Computers just use electrons and magnetizable areas on a magnetic tape or disk to physically represent numbers rather than beans, but the principle is the same. So much for bean counters.

Early tape drives for computers of the 1950's and 1960's did put a lot of binary data in a small space, the commonest standard being to use 8 parallel tracks to save on the length of tape needed to store data of a large blocks. But if you look at an old movie of a computer of this time, the reels of tape are always spinning as the computer tries to find chunks of data on different spots on the tape. So the speed problem became critical as computers got faster and needed to look things up on the tape faster. The mechanisms became a speed bottleneck.

An engineer from IBM had a better idea after taking a lunch break at a diner that had a juke box. He reasoned, if so much data was needed to be looked up that could be found only at unpredictable (mathematically speaking, random from the analytical model used to think of the problem) locations on the tape, perhaps a tape was not the best shape of magnetic medium to use. A disk, like a phonograph record would allow one to get to any track on it without nearly as much physcial movement he reasoned, and so the disk drive was born. It was a matter of, as with a long playing phonograph record, moving the arm to the right track, rather than spinning a reel of tape, many feet along the thread of data written on it, that saved physical movement to speed things up. A genius sort of inspiration! Of course, a phonograph record has its track in a spiral form so the music will not be interrupted as it would be if the tracks were all circles, closing in on themselves, but the computer, very interrupt tolerant did not need this and so the computer disks used non-overlapping circles one inside the other as the tracks to store the data magnetically on, as used to this day, and in one single line of binary bits. A bit stream, when seen electronically at the electronic circuits that feed the electro-mechanical part of the disk drive's data handling pictures it.

So IBM put its first disk drive on the market in 1957. It was a hard disk, with a removable stacked disk unit, magnetic coating on aluminum base, disks, and it was about waist high with a plastic cover to keep out dust that would otherwise obscure the tiney magnetic spots where a binary bit was stored on a track on it. And that is how it all started!

B.F. Skinner And The Computer Hacker

With the passing of B.F. Skinner, the American psychologist known for behavioursim, it is probably a good time to mention his relevance to the spirit of our time as represented by the way working with microcomputers has affected the way we think about thinking. Prof. B.F. Skinner seemed to want to take 'thinking' as an explanation of why people do things, right out of psychology. He wanted a psychology that in explaning a person's reason for doing anything, would call only on descriptions of his behaviour as observed by an external, impartial observer. He did not trust the often vivid descriptions of the ideas going through people's heads when they did this or that, as being useful in explaning their actions. He believed that these ideas were an appearance of things being decided rather than the real seat of decision, a by-product of the real determining factors. He hoped that the real determining factors were much deeper and more describable by laws similar to those of physics, and his unique contribution to the psychology of behaviourism was to propose a deep-seated type of conditioning, operant conditioning, a sort of association that determines behaviour ultimately regardless of the ideas going through our minds on the surface, while it is happening. Our body goes along the tracks of this operant conditioning and our ideas no more determine its course than the screams of a roller-coaster rider. Our ideas and vivid sensations just go along for the ride of life and like a roller coaster rider, have no hands on the control levers of our life, psychological(life)or otherwise. (In a strange twist some Freudians who also believe in deep unconscious factors prevailing over surface, rationalisms, also bought into behaviourism, at least in the U.S.)

In a world of the 1950's, the heyday of this type of psychology, control mechanisms seen in the machinery that was the model for this kind of mechanistic, materialistic thinking, the control mechanisms of say the guns and missles of the day (and B.F. Skinner worked on pidgeon guided missiles), were simplistic, analogue computers at best with only a few factors serving as input data for their 'computing'. In today's world, where even a simple, orphan home computer can be programmed to take into account hundreds of factors and run them through complicated equations of an arithmetic or Boolean kind in long complicated sequences of instructions through almost infinite loops, it is a little harder to be convinced of the existence of simple laws, unrelated to hard thinking and logical processes, as the way that human beings solve problems in the real world. We do not solve these problems by using long equations or Boolean expressions, juggled in our minds like absent-minded mathematics professors, splitting our attention between the calculations in our head and the world whizzing by in front of our noses. But it would seem to most of us who work or play at computer programming that the human mind in a problem solving situation will revert to some sort of rough and ready, abreviated or trial and error approach to solving the problem using logic of a less formal type than the straight Boolean of computers. Nonetheless it is based on the same logical features of the world and events and can just as easily be simulated simplisticly by a computer set up with a program to run the problem by solving a series of Boolean or arithmetic equations. The computer is much more determined by the formal details of how the equations are set up and happily will do what your tell it, going by form only, rather than what you meant to tell it to do. But is would seem that both the computer and the human being have come to grips with the logical relations between events in the world, use them to make decisions, and use the decisions to choose between alternative actions. Leaving the logical, mental decision making process out of psychology would seem to our generation, the first to get into the nitty-gritty of computer use at the lowest, most nuts and bolts level of understanding, to be an oversimplification of the laws of behaviour either human or that of the new computer controlled robots. On the passing of B.F. Skinner, this is his epitaph, that his life saw changes in science and machines so radical that never again would a human generation compare a person to an unthinking piece of steel or a biological function like a reflex.

But again, B.F. Skinner simply put a once new twist on a school of psychology that goes back very far indeed (beyond Henry Regius, contemporary of DesCartes and Spinoza). That school would replace the often frivolous attribution of our life's destiny to decisions taken on 'feeling a whim' oblivious to the complicated and deep-seated forces within our being and in the external world that pull our strings more than we care admit. Behaviourism in some brands already has the seeds of new complexities, organismic variables, and possibly context analysis. It is not dead.

The Next Revolution In Office Computing And How To Be Ready For It

It is getting hard to remember when the clicketty clack of electric typewriters was the only way to get text out of an office or around in the form of inter-office memos. Today, a lot of text never touches paper, and indeed in some offices these days, hit by economic pressures, there is a move to reduce paper use as much as possible. Today's office is built on doing as much as possible, typing (or keyboarding as it is now referred to), only once. This is starting to result in more of the work that typists used to do, perhaps not even needing to know spelling, being done on a level of intelligence of computers that can check spelling and catch some grammar mistakes too. This saves human checks for the editing of documents on higher and more subtle levels. If scanners and voice-input wordprocessors are just around the corner, the bottom level of this process, the manual keyboarding, may also be cut to a fraction of the work it now provides. That means that although the reluctance of businesses to spend on new hardware and the lack of need for it, with business generally slow, may delay it, the largely female staff doing this work now should be looking to learn new levels of skills that will enable them to survive the shake-up and redundancies that will inevitably come. Many will try to move into accounting using spreadsheets, some into data work as well as the higher level editing and administration. It would also be a good idea to get into the theory of use of computers, low level and high level now since those most affected will have little time when this transition comes. It is time right now to start understanding some of the finer points of computers—as well as English and other business subjects.

That raises an interesting point in that while computer user group membership may be valuable in this upgrading, as many women are finding, there seems to be a gap in the line-up of educational materials available for this upgrading. In order to search for ways of filling this gap, of ways to explain low level disk file and data structure and operations in terms for someone working in an office and not particularly technical or electronic oriented, this writer has been looking into the sort of concepts and material to use. Why not pick common things in an office to use in these explanations, rather than try to build up a vocabulary of technical terms like bit and byte, track, cylinder, etc. from scratch? Maybe one of my early attempts at writing this sort of low level explanation of today's computer systems, could be presented in a future newsletter issue. To ready it for a real book the text would have to be spread more thinly among more pages and alternated with more drawings by way of illustration, of course, but we will see.

For writers, managers and computer users of a more casual level, this looks from here to be the sort of material that will be needed more and more in the future. It is hard to have confidence in this material being done well in the future when major books by major, well reputed writing groups and publishers, will plunk down in the middle of an explanation of low level data structure, a few statements of things that just are not so. That means if experts or hacking enthusiasts are not going to be writing this a lot of what will be written will be worse than uselsss; it will be misleading, and lead to discouraging those who should be studying this sort of material. It will also be untestable, if simply stated in prose in a book. So what we need is both explanations in text and ways of testing them. Since low level hacking is too hard for the average student, that means putting data handling exercises into some sort of computer program routines, like BASIC.

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The Revolution Begins - Data By Wire Comes Before Data By Voice

Technology is accepted or rejected on economic grounds and today, we might well ask, why we should worry about new types of automation sweeping into the work world, when increases of automation are driven by the economics of labour scarcity, something that the current recessionary times are not characterized by? One answer is that companies and governments will continue to make economies in labour use that save money, and are easy enough to plan. What this means is that existing technologies are likely to be pushed further, even if newer ones that would require a whole new range of equipment are not. Compatibility is the watchword for economy now and those who can quickly learn a new piece of software for an old type of computer like the IBM PC compatible. will be employees worth their weight in gold. They have what in computers is called 100% compatibility.

Voice-input word processors that merely need dictating to, may be ten or twelve years away from replacing very many desktop, keyboard-based computer applications, and of course will never replace them all, although transforming them is likely. The big revolution that might eliminate some more jobs and change the average job is the method of computer input that goes by wire rather than by hand, networking in other words. That means that the concepts of network data sharing, filtering and translating, as well as the protocols of transmission, would be the next concepts to look at for low-level computer concept courses. Data structure and the way data files are broken into blocks, similar to disk files being broken into sectors for saving on disk, would be a good concept to employ to judge a book on, as to whether it really gets down to the low level or skips across the top.

Famous Mainframe Computer Software: Line Editors

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One of the pieces of computer software that most users of old mainframe computers will have encountered, is the line editor, a primitive text editor program, a predecessor of both full-featured word processors and the full-screen editors that computer hobbyists are used to in home computers, (and usually used to edit BASIC programs, or the BASIC command line). The old line editor was justly famous, not for a good reason but a bad; it was simply a frustrating piece of software to use. Fortunately, it was quickly bypassed by the evolution of better text editors by the time the home computer started to become a mass-market item, so few home computer users have had much of a run in with it.

So, it is necessary to take you to a session in the 1970's or earlier, with you, the young student, sitting down to a video terminal (or old teleprinter terminal), faced with a deadline, and confusing instructions on how to use it and you type a line, "This is a test.", and hit the enter key. Then another line, "This is easzx", and hit the enter key for that line. Then you say, "Oops, made a mistake," and try to correct it. You look at the commands and realize that you must get into command mode. You find a control key like "Escape" will do that. Unfortunately, you are into a new screen now, and the rest has scrolled far enough, that you want to display what is there. Try the command "L" for list, and the computer takes it, and lists nothing. Problem is, the list will list a page of lines, after where you left off. There is an internal variable in the program that points to which line you left off at. How to reset it to the first line of the program? Try the 'up' command. Still nothing. Of course it moved the last line, but does not list it, so you enter the L for list command again, and again nothing. The UP the pointer to the current line up one, but the list moved it down one again, so when you went to list again, you got nothing. Eventually you find that a command like B for bottom (or begin) moves the cursor-line pointer all the way to the top, or was B for bottom, I forgot. Anyway, after a good three hour session while others wait to get their hands on your terminal, with varying degrees of patience, you have managed to save mostly unknown garbage to your file in the main computer storage area. And of course, it is not by the end of the session, but a long, long time later, that you realize what could have gone wrong and come to the point where you can explain what must have gone wrong.

The writer had his initiation as an evening student on a terminal at college to what was practically a super computer, running XENIX. Others will remember first frustrations on other hardware. But those who critisize the CP/M editor, ED, or the MS DOS editor EDLIN, will not likely appreciate how those editors were big improvements. Such line editors have three parts, or modules — a one-line-at-a-time line enter function, a command interpreter to take your commands like "d", to delete the line the line-pointer is pointing to, and a set of subroutines to do the actual low-level editing, data (text) moving and slicing, etc. To put it mildly, working with such an editor required a lot of skill, and memorizing both commands and what they did (and did not do) as well as keeping a mental eye image of where the current line is (the line the line pointer refers to) and where the disjointed display of lines shown on the screen fit into the whole text. Getting such features as word search and search and replace must have made such line editors seem like a great improvement at the time to data processing professionals. It is just that now, we have so much more and available so much more easily with screen editors and word processors.

In the middle of the early home computer era, home computers switched from editors based on the earlier line editor type to screen editors for their use of the BASIC operating system command line and BASIC programs, the dividing line in for example Commodore computers coming between the line-edit type VIC-20 and the screen edit type, Commodore 64, the latter also followed in IBM PC/MS DOS BASIC versions at the beginning (BASICA and GWBASIC). The early BASIC editors used the line-at-a-time approach at least partly, because ASCII lines stand alone, a feature of BASIC language itself that resulted in part from its use in terminals with multi-user computers and in part in a tradition of breaking a program into lines that goes back to unit record type input/output of punched cards with FORTRAN. But they differed from the old mainframe editors for text in that they automatically placed updated lines on the screen (normally) and also lacked the complicated edit commands. (Unfortunately a variable search and replace might have been good in BASIC and variable table listing, etc. but BASIC fell out of favour as a programming language around the time such programmer-friendly features started showing up in BASIC dialects.)

So that is the ancient history of line editors. Let's be happy they're history!

1-94 GEN

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The Timex-Sinclair Story Continued from page 2

The QL was quite a different computer from the ZX-81/TS1000 and TS-2068 using a different microprocessor, the 68008, that virtually no other computer used in exactly the same version (that with an 8-bit data bus). It also was much more expensive and more complicated, the daunting hardware and software required to make accessories run being a real Quantuum Leap which no amateur hardware developer seemed prepared to commit to. So the hardware accessories like disk drive interfaces, when they came were produced by professionals. The software also was produced by professionals since it was complicated and could not easily be ported from 8-bit software, especially with the QL's complicated operating system and unique special features like networking, which required special machine code interface routines. This did put software initially out of the reach of most, at least in computer languages which sold for $200-400 or more each language. The cost of upgrading to such a complicated computer, and one in which unique hacker-technophile features were imbedded, devices like a special, fast cassette called a microdrive, pretty well killed the chance of the QL becoming a mass market home computer or even appealing to those already sold on Sinclair products, coming to the Sinclair computers originally because they were very cheap. But, when the big dealers, in the chaos of the financial failure and buyout of Sinclair's firm and the announcement by the buyer, Amstrad computer, to offer no further improvements of the QL, dumped the QL and accessories at discount prices, enough T/S computer users then bought the QL and created a viable QL special interest group within many user groups as well as making from old or new group members, uniquely QL user groups. Ironically the Dunkirk of the QL in North America, where its introduction had been considerably delayed during the fixing of ROM bugs after its European release, became its salvation as far as the existing users upgrading to it were concerned, the dumping of large stocks at discount prices tempting many who had become bored with the last upgrade (to the TS2068) to try the QL. Mostly, if they got it working well, they liked it, although some units had persistent powersupply and microdrive bad luck.

Now there were two factions waring in the bossom of T/S user groups in which a sufficient number had upgraded, since the QL had its own separate magazines to subscribe to, its own programs, its own unique dialect of BASIC and its own unique needs for utilities to handle microdrive and disk use. The one common link to its Z-80-based Timex-Sinclair bretheren was that it could run CP/M (with the aid of a software emulator) like some TS-2068's (with the appropriate and less popular types of disk drive interfaces), but at least that meant it could be more easily used with a modem and CP/M modem software to access the BBS networks that were just then becoming a fad in user groups and among user group members no matter what the computer type.

Many in the user groups did not upgrade to the QL and stayed with the TS2068, and a few even stayed with the ZX-81/TS1000, not upgrading to either. For these the user groups offered program listings and tips on floppy disk use, the Larken LKDOS for the TS2068 extending the usefulness of that computer and allowing the fitting of a 256Kbyte RAM disk which could, with the aid of a battery pack, keep in its memory all the things that many users of bigger computers often put on a hard disk, or at least a small one, and they would last reliably in the battery-fed RAM disk for a year or more. The addition of a RAM disk or the other popular accessory, a printer buffer (in the days before even cheap dot matrix printers acquired a big built-in RAM buffer) was the way that the old 8-bit computers extended their useful life cycle, in the Commodore making the GEOS graphic interface run reasonably fast (with the REU RAM expansion cartridge), along with adding another bank-switchable 64K of RAM, (as in the Commodore 128, Apple II G, and some CP/M computers). But as the IBM PC computer designers discovered even 640K or RAM is quickly used up, little alone 128K, and in the end, only a different microprocessor capable of addressing directly much more than 64K, would allow the use of truly modern graphic handling

Although Timex-Sinclair user group activity and suppliers are diminished, they still exist and operate by mailorder, the T/SNUG (T/S North America User Group) being an example. Although the QL was much more popular in Europe, there are still users and groups in North America. And the latest twist to make Timex-Sinclair and QL computer programming and experimentation immortal, is putting the ROM's and emulators inside software that allows them to run on an IBM AT or 386. And what became of Sir Clive Sinclair? Sir Clive worked for a long time on making a new type of computer processor chip, the wafer-scale integration super-computer on a chip. In between, he produced an electric car, tiny and so ahead of its time, and a pocket, flat-screen tv set, using innovative CRT technology (flat picture tube). But his real legacy is in the many, many ordinary people to whom he introduced computer literacy and programming, even if at prices that today's computer industry does not feel it can make a profit in, and so has abandoned the low cost computer.

Computers and Prices —Some Predictions

In the most excellent book, "Dvorak Predicts," by computer guru John C. Dvorak, publ. McGraw-Hill, 1994, Dvorak predicts the death of the desktop computer in favour of the laptop. He says that a laptop can be equipped with a video screen of serious size, a better keybaord, and so on, when you bring it home for the evening, and so, there is no need to have two computers. Similarly, at the office the laptop can be plugged into such big, desktop computer interfaces, and unplugged, to run on its built-in LCD screen and independently of a network, in the same way. Is there anything that cannot be miniaturized to suit a laptop; (other than screen, keyboard or printer) we might ask? Likely not. It is simply a product of the drive for efficiency evolving smaller and smaller electronics. For the hobbyist, the practical advice might be to buy a laptop if you have the money and need for a new computer, state-of-the art, or a big old desktop, if you buy used, since so many people will probably be getting rid of them in the next few years, if Dvorak's prediction is correct.

There it is on the front pages of the newspaper, that the middle-class is shrinking, and jobs created, if at all, are poor substitutes for a unionized manufacturing or refining industry job, with its pay packet and steadiness that built so many suburbs with small houses, but nice cars and no real poverty, in the 1960's. Then you flip to the computer shop advertisements inside and find that computers are more costly than ever. Something will eventually have to give. What will be the solution, the sort of computer that those with jobs that do not offer the option of spending $3,000-$5,000 on a home computer will buy. My answer is that it may not be a computer at all. It may be more like a word processor or a cartridge based game machine, but not selling for $2,000 plus. In fact, when you see wordprocessors that will input and output to a 3½ inch MS DOS formatted disk, the disk drive hidden inside the word processor, and you see it selling for $300 to $700, then you perhaps have seen the future for all but a few computer nerds on the poor side of the middle class separating line, who insist on doing their own software hacking. And of course, such wordprocessors are now selling and have been for a year or two, at business or consumer discounters, at exactly those prices. Some have bilingual spelling checkers built in, and some, displays brighter than the average laptop computer,(obtained with plasma).

So if the bright and medium bright will buy them for the price, the rest will buy them instead of a first home computer because of the word processors' more friendly interfaces, using graphics like those of Microsoft Windows or the Apple Macintoshes, and perhaps speech interfaces and modem connections, next. They will be the platform for a closed system of software that will be particularly hacker-nerdy fandangling-free. No fuss. No bother. Just turn it on and type. So the less bright and the average techno-phobic type, young or old, will buy them for their ease of operation. Since the software will be built-in and on cartridges likely, in the next phase, both hardware and software manufacturers will like them because they will be software piracy-proof.and users will like the simplicity.

The big motivation is commercial, for software piracy will continue to be a problem for big business, software and hardware makers alike, as long as critical software can be easily copied off a disk, and without anyone 'knowing.' (The copying of ROM is a commercial activity that can be more easily caught and prosecuted.) So the smart but poor, the average person and the manufacturers would like it, and so, it will take little else for mass production to bring the costs down and the benefit levels up, via added features and options. Of course, real computers will still have a sort of snob appeal for a long while after.

What counterpredictions could one offer? While laptop sales are up, it seems that the desktop is still the most bought, since it still is less expensive than the laptop, and this is a price-sensitive world. That may delay the death of the desktop computer. Another factor is that computer technology is changing towards multi-media, and maybe soon, computers with word processors that you will be able to dictate to. This software will take a long time to get the bugs ironed out and settle down to a standardized form, and the microcomputer rather than the ROM-based word-processor, is the best way to keep things flexible. A mistake or a new trend in added features is but an interface or special processor board away, at the most expensive end of modification, and a set of disks, in the least expensive case of modification. This would prolong the survival of computers, and of desktop types in particular, since they have the easiest hardware expandability. For that reason the near future remains as unpredictable as ever.